

WHAT IS CLAIMED IS:

1. A method for performing a timing soft error check on a simulated circuit, the method comprising the following steps:

using a critical-path or full-chip circuit to be analyzed of the simulated circuit;
simulating the circuit based on an initial minimum optimization parameter and an initial maximum optimization parameter;

calculating a minimum and maximum primary criterion parameter for each of the respective minimum and maximum optimization parameters;

if the minimum and maximum optimization parameters do not indicate the same status, then:

determining a new current optimization parameter;
simulating the circuit based on the new optimization parameter;
if the simulation is successful, then performing a timing soft error check;
if the simulation is not successful then determining if the primary criterion parameter is converging into a specified range; and
setting the current optimization parameter to a new value if the primary criterion parameter is not converging into a specified range.

2. The method of claim 1 wherein the new current optimization parameter is determined by averaging the minimum and the maximum optimization parameters.

3. The method of claim 1 wherein the optimization parameter is set to the current minimum optimization value when the current minimum optimization value and the current optimization value indicate the same status.
4. The method of claim 1 wherein the optimization parameter is set to the current maximum optimization value when the current minimum optimization value and the current optimization value do not indicate the same status.
5. The method of claim 1 wherein the process reiterates until the primary criterion parameter converges into the specified range.
6. The method of claim 1 wherein the optimization parameter is a setup or hold time for the circuit simulation.
7. The method of claim 1 wherein the primary criterion parameter is a bisection error of the circuit simulation.
8. The method of claim 1 wherein the simulation is successful and the timing soft error check is performed as determined by a bisection goal.
9. The method of claim 1 wherein if the primary criterion parameter is converging into the specified range, then the current optimization parameter is the setup and hold time for the circuit simulation.

10. The method of claim 1 wherein the timing soft error check comprises:
 - determining new maximum and minimum optimization parameters;
 - determining a current optimization parameter based on the maximum and minimum optimization parameters;
 - simulating the circuit based on the current optimization parameter;
 - determining a current primary criterion parameter and a secondary criterion parameter from the circuit simulation;
 - determining whether the primary criterion parameter and the secondary criterion parameter converge into a specified range;
 - if the primary criterion parameter and the secondary criterion parameter converge, then saving the current optimization parameter as a setup and hold time for the circuit simulation; and
 - if the primary criterion parameter and the secondary criterion parameter do not converge, then setting the current optimization parameter to a new value.
11. The method of claim 10 wherein the current optimization value is set to the minimum optimization value if the simulations based on the current minimum and current optimization parameters indicate the same status.
12. The method of claim 10 wherein the current optimization value is set to the maximum optimization value if the simulations based on the current maximum and the current optimization parameters indicate the same status.

13. A method for performing a timing-soft error check and timing characterization simultaneously, the method comprising the steps of:

- defining a critical-path or full-chip circuit to be analyzed;
- simulating the circuit;
- determining an ideal optimization parameter from the circuit simulation; and
- performing a timing-soft error check with the ideal optimization parameter.

14. The method of claim 13 comprising the step of iteratively simulating the circuit with new optimization parameters in order to determine the ideal optimization parameter.

15. The method of claim 13 wherein the ideal optimization parameter is determined by performing the following steps:

- simulating the circuit with an initial minimum optimization parameter;
- simulating the circuit with an initial maximum optimization parameter;
- calculating a minimum and maximum primary criterion parameter for each of the respective minimum and maximum optimization parameters;
- if the minimum and maximum optimization parameters do not indicate the same status, then:
 - determining a new current optimization parameter;
 - simulating the circuit based on the new optimization parameter;
 - if the simulation is successful, then performing the timing soft error check;
 - if the simulation is not successful then determining if the primary criterion parameter is converging into a specified range; and

setting the current optimization parameter to a new value if the primary
criterion parameter is not converging into the specified range.